

Stavrianopoulos et al.

Serial No.: 08/486,070

Filed: June 7, 1995

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Under 37 C.F.R. §1.115 -- May 8, 2003]

REMARKS

Reconsideration of this application is respectfully requested.

Claims 1576-2160 were previously pending in this application. Claims 1576 and 1670 have been amended and new claims 2161 and 2162 have been added. No claims have been canceled by this paper. Accordingly, as amended and added above, claims 1576-2162 are being presented for further examination in this application.

Claim Amendments

In a further sincere effort to define their invention more clearly, Applicants have entered new replacement claims 1576 and 1670, both of which are independent and are directed to their claimed array invention. As set forth above, replacement claim 1576 now recites "[a]n array comprising a non-porous substrate having surfaces, each surface comprising at least one double-stranded nucleic acid fixed or immobilized to one or more reactive groups or binding sites on said surface, wherein at least one nucleic acid strand or a sequence therefrom comprises one or more non-radioactive chemical labels which comprise a non-radioactive signaling moiety or moieties which are quantifiable or detectable, and wherein said non-porous substrate comprises siliceous matter or polymeric material." In the case of claim 1670, Applicants are now claiming "[a]n array comprising a non-porous substrate having surfaces, each surface comprising at least one nucleic acid strand fixed or immobilized to one or more reactive groups or binding sites on said surface, and wherein said non-porous substrate comprises siliceous matter or polymeric material." The changes to claims 1576 and 1670 are believed to better reflect the

patentable nature of Applicants' claimed array which, among other things, comprises a non-porous substrate comprising siliceous matter or polymeric material.¹

A marked-up version of amended claims 1576 and 1670 is attached as Exhibit 1. This marked-up version is entitled "Marked-Up Version Of Amended Claims."

Reference to Applicants' claimed array subject matter taken in its historical context might be helpful to understanding the basis for the above amendments to claims 1576 and 1670. Array claims (143-182) were first added to this application by Applicants' July 21, 1998 Amendment Under 37 C.F.R. §1.115. Claim 143 was independent and recited "[a]n array of substrate surfaces, said array comprising a plurality of nucleic acid strands fixed or immobilized to said substrate surfaces." Later, in their May 18, 1999 Third Supplemental Amendment, Applicants canceled their array claims 143-182 in favor of new claims 325-376.² In this later set, claim 325 was independent and it recited "[a]n array of substrate surfaces, each substrate surface comprising at least one double-stranded nucleic

¹ In effect, the following language has been deleted from claims 1576 and 1670:

. . . wherein at least one nucleic acid strand or a sequence therefrom in one of said surfaces is different from at least one other nucleic acid strand or a sequence therefrom in another surface . . .

² Other array embodiments were included among claims 325-373. For example, claim 374 was directed to "[a] collection or set comprising the array of any of claims 325 to 373, wherein said substrate surface is porous or non-porous." Further, claim 375 was directed to "[a] transparent non-porous or translucent non-porous system capable of retaining or containing a fluid or solution, which system comprises the array of any of claims 325 to 373." Lastly, claim 376 depended from claim 375, and it recited "[t]he system of claim 375, wherein said substrate surfaces are contained within the transparent non-porous or translucent non-porous system."

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acid fixed or immobilized thereto, wherein at least one strand comprises one or more chemical labels which comprises a signaling entity or entities which are quantifiable or detectable, and wherein at least one nucleic acid strand or a sequence therefrom in one of said substrate surfaces is different from at least one other nucleic acid strand or a sequence therefrom in another substrate surface." The subject of these later array claims was listed as item no. 4 among the issues discussed at the March 23, 1999 interview (see page 53 in Applicants' May 18, 1999 Third Supplemental Amendment). The array claims were also discussed on the next page (54) in the same paper.

More recently, in Applicants' April 10, 2002 Amendment Under 37 C.F.R. §1.116, array claims 1266-1424 were added in which the claimed subject matter recited that "said [array substrate] surfaces comprise siliceous matter or polymeric material." In Applicants' June 17, 2002 Supplemental Amendment to their April 10, 2002 Amendment, array claims 1576-1761 were added in place of claims 1266-1424. Like their predecessor claims, array claims 1576-1761 were also limited to "siliceous matter or polymeric material." Unlike their predecessor claims, however, array claims 1576-1761 were further limited to "an array comprising a *non-porous* substrate having surfaces . . ."

In summary, since the first presentation of their array claims in July 1998, Applicants have seen fit to add two features to their claimed array subject matter. First, the claimed subject matter is now defined both in the preamble and in the body of the claim as "[a]n array comprising a non-porous substrate having surfaces." Second, the non-porous substrate in their claimed array subject matter is further defined as comprising siliceous matter or polymeric material.

It is believed that prior to the introduction of the presently claimed array subject matter, the recitation that "wherein at least one nucleic acid strand or a

sequence therefrom in one of said surfaces is different from at least one other nucleic acid strand or a sequence therefrom in another surface" was helpful if not important to distinguish Applicants' array invention from the prior art. Having recently added the characteristics that the substrate is non-porous and that the non-porous substrate comprises siliceous matter or polymeric material, the previous recitation that one nucleic acid strand or sequence is different from another nucleic acid strand or sequence is no longer believed to be necessary to distinguish the present array invention over the prior art. Merely, by way of illustration, Grunstein and Hogness (1975) ["Colony hybridization: A method for the isolation of cloned DNAs that contain a specific gene," Proc. Natl. Acad. Sci. USA 72:3961-3965] and Benton and Davis (1977) ["Screening λ gt Recombinant Clones by Hybridization to Single Plaques in situ," Science 196:180-182]³ are disclosures relating to screening methods for hybrid plasmids and single plaques of recombinant phage, respectively. In short, the Grunstein and Benton publications concern the use of replica plating onto porous membranes. Clearly, both publications are "pre-array" disclosures confined to the use of porous membranes. As noted above, Applicants' claimed arrays are directed to non-porous substrates comprising siliceous matter or polymeric material. Thus, their present array invention is distinguishable from such prior art.

New Claims

New claims 2161 and 2162 have been added above. Both new claims recite the language that was deleted from claims 1576 and 1670. Thus, both claims

³ Copies of Grunstein and Hogness (1975) and Benton and Davis (1977) are attached to this paper as Exhibits 2 and 3, respectively.

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recite "wherein at least one nucleic acid strand or a sequence therefrom in one of said surfaces is different from at least one other nucleic acid strand or a sequence therefrom in another surface."

Because language has been removed in two independent claims and is now recited in two dependent claims that have been added, it is believed that no issue of new matter is presented by these claim changes. Entry of these amendments and the two new claims is respectfully requested.

Early and favorable action is respectfully requested.

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SUMMARY AND CONCLUSIONS

Claims 1576-2162 are presented for further examination. Of these, claims 1576 and 1670 have been amended and new claims 2161-2162 have been added. No claims have been canceled by this paper.

The claim fee for adding new claims 2161 and 2162 is \$36. The Patent and Trademark Office is hereby authorized to charge the requisite \$36 claim fee to Deposit Account No. 05-1135. No other fee or fees are believed due in connection with this Supplemental Amendment. In the event that any other fee or fees are due, however, The Patent and Trademark Office is hereby authorized to charge the amount of any such other fee(s) to Deposit Account No. 05-1135, or to credit any overpayment thereto.

If a telephone conversation would further the prosecution of the present application, Applicants' undersigned attorney request that he be contacted at the number provided below.

Respectfully submitted,



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MARKED-UP VERSION OF AMENDED CLAIMS

1576. (Twice Amended) An array comprising a non-porous substrate having surfaces, each surface comprising at least one double-stranded nucleic acid fixed or immobilized to one or more reactive groups or binding sites on said surface, wherein at least one nucleic acid strand or a sequence therefrom comprises one or more non-radioactive chemical labels which comprise a non-radioactive signaling moiety or moieties which are quantifiable or detectable, [~~wherein at least one nucleic acid strand or a sequence therefrom in one of said surfaces is different from at least one other nucleic acid strand or a sequence therefrom in another surface,~~] and wherein said non-porous substrate comprises siliceous matter or polymeric material.

1670. (Twice Amended) An array comprising a non-porous substrate having surfaces, each surface comprising at least one nucleic acid strand fixed or immobilized to one or more reactive groups or binding sites on said surface, [~~wherein at least one nucleic acid strand or a sequence therefrom in one of said surfaces is different from at least one other nucleic acid strand or a sequence therefrom in another surface,~~] and wherein said non-porous substrate comprises siliceous matter or polymeric material.

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